Chemistry 141 Name

Quiz 9 (22 points) May 6, 2016

All work must be show to receive credit. Remember, significant figures are important!

, R=0.0821 L atm/mol K = 8.314 J/mol K

1. (8 points) A substance has a normal boiling point of 715 K, a normal freezing point of 247K, A triple point at 388K and 403 torr, and a critical point at 931K and 40210 torr. Draw a phase diagram for this substance, labeling the liquid, gas, and solid phases, the triple point, the critical point, and the supercritical fluid.

Which is more dense the liquid or solid phase? Explain how you arrived at this answer.

1. (6 points) Tell the compound that you would expect to have the higher melting point in each of the following pairs and explain your reasoning.
   1. NaCl and NaI
   2. C2Cl6 and C2I6
2. (4 points) Water has a vapor pressure of 24 mmHg at 25oC and a heat of vaporization of 40.7 kJ/mol. What is the vapor pressure of water at 67oC?

Use for question 4

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| --- | --- | --- | --- |
| Name | Lewis Electron-Dot Diagram | Boiling Point (oC) | Vapor Pressure at 20oC (mm Hg) |
| Dichloromethane |  | 39.6 | 353 |
| Carbon tetrachloride |  | 76.7 | 89 |

1. (4 Points) In terms of IMFs, explain why dichloromethane has a higher vapor pressure than carbon tetrachloride.